Co-sponsored by
EES and CSES

Frontiers in Geoscience Colloquium

Monday, August 15, 2016
3:00pm – 4:00pm
Physics Auditorium (TA-3, Bldg 215)

Parameter Estimation for some Geoscience Applications using a Measure-Theoretic Approach

Professor Clint Dawson

University of Texas at Austin

Effective modeling of complex physical systems arising in the geosciences is dependent on knowing parameters which are often difficult or impossible to measure in situ. In this talk we focus on two such problems, estimating parameters for groundwater flow and contaminant transport, and estimating parameters within a coastal ocean model. The approach we will describe, proposed by collaborators D. Estep, T. Butler and others, is based on a novel stochastic inversion technique based on measure theory. In this approach, given a probability space on certain observable quantities of interest, one searches for the sets of highest probability in parameter space which give rise to these observables. When viewed as mappings between sets, the stochastic inversion problem is well-posed in certain settings, but there are computational challenges related to the set construction. We will focus the talk on estimating scalar parameters and fields in a contaminant transport setting, and in estimating bottom friction in a complicated near-shore coastal application. The talk is joint work with M. Vesselinov at LANL, D. Estep at Colorado State University, T. Butler at U. Colorado Denver, S. Mattis and L. Graham from UT Austin, and the work is funded by DOE and NSF.

Host: Scott Hansen, EES-16, 4-0712

UNCLASSIFIED